

WHAT IS CLAIMED IS:

1. A method for manufacturing molten iron, comprising the steps of:
  - producing a mixture containing iron by drying and mixing iron containing ores and additives;
  - passing the mixture containing iron through one or more successively-connected fluidized beds to reduce and calcine the mixture to thereby perform conversion into a reduced material;
  - forming a coal packed bed, which is a heat source in which the reduced material has been melted;
  - charging the reduced material to the coal packed bed and supplying oxygen to the coal packed bed to manufacture iron;
  - supplying reduced gas exhausted from the coal packed bed to the fluidized bed; and
  - in the step of converting the mixture to a reduced material directly supplying and combusting, oxygen in an area where reduced gas flows to the fluidized bed.
2. The method of claim 1, comprising in the step of converting the mixture containing iron to a reduced material, supplying water separately from oxygen supply combustion process and mixing the water with the oxygen.
3. The method of claim 2, wherein the water is process water or steam.
4. The method of claim 2, comprising supplying the water at a rate of 300~500Nm<sup>3</sup>/hr.
5. The method of claim 1, comprising supplying and combusting the oxygen in the case where an internal temperature of a fluidized-bed is 650°C or higher.
6. The method of claim 1, wherein the step of converting the mixture

containing iron to a reduced material comprises the steps of:

(a) pre-heating the mixture containing iron in a first fluidized bed;

(b) performing preliminary reduction of the pre-heated mixture

containing iron in a second fluidized bed;

(c) performing final reduction of the mixture containing iron that has undergone preliminary reduction to thereby realize conversion into the reduced material; and

directly supplying and combusting the oxygen in steps (a) and (b).

7. The method of claim 6, comprising supplying and combusting oxygen immediately prior to steps (a), (b), and (c).

8. The method of claim 7, comprising supplying water separately from the supply and combustion of the oxygen.

9. An apparatus for manufacturing molten iron, comprising:

one or more fluidized-bed reactors that reduce and calcine iron ores and additives which are dried and mixed, to convert into a reduced material;

a melter-gasifier for charging the reduced material and receiving the supply of oxygen to manufacture iron; and

a reduced gas supply line for supplying reducing gas exhausted from the melter-gasifier to the fluidized-bed reactors,

wherein the fluidized-bed reactors each include a dispersing plate at a lower area thereof and through which the reduced gas passes, and an oxygen burner mounted to an outer wall of the fluidized-bed reactor at an area above the dispersing plate.

10. The apparatus of claim 9, wherein the oxygen burner comprises:

a first member inside of which coolant circulates in a lengthwise

direction; and

a second member encompassed by the first member along a lengthwise direction in a state separated from the same, and inside of which coolant is circulated,

wherein oxygen is supplied and combusted between the first member and the second member, and a distance between the first member and the second member is getting reduced as coming close to the inside of the fluidized-bed reactor.

11. The apparatus of claim 9, wherein the fluidized-bed reactors each include a water supply nozzle mounted to an outer wall of the fluidized-bed reactor at an area above the dispersing plate, and positioned at an area in the vicinity of the oxygen burner.

12. The apparatus of claim 11, wherein a direction that the water supply nozzle supplies water is at an angle of  $4\sim 15^\circ$  with respect to the lengthwise direction of the oxygen burner.

13. The apparatus of claim 12, wherein the water is one of process water and steam.

14. The apparatus of claim 12, wherein the water is atomized and supplied at a rate of  $300\sim 500\text{Nm}^3/\text{hr}$ .

15. The apparatus of claim 9, wherein each of the fluidized-bed reactors comprises:

a pre-heating furnace for pre-heating the mixture containing iron;

a preliminary reduction furnace connected to the pre-heating furnace and performing preliminary reduction of the pre-heated mixture containing iron; and

a final reduction furnace connected to the preliminary reduction furnace and performing final reduction of the mixture containing iron that has undergone preliminary reduction to thereby realize conversion into the reduced

material,

wherein an oxygen burner is included in each of the pre-heating furnace and the preliminary reduction furnace.

16. The apparatus of claim 15, wherein each of the fluidized-bed reactors further comprises a water supply nozzle mounted to an outer wall of the fluidized-bed reactor at an area above the dispersing plate, and is positioned in the vicinity of the oxygen burner.